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Case Report

Magnetic Resonance Imaging Features of Chronic Foreign-Body Granulomatous Reaction Following Gluteal Dermal Filler Injection: A Clinical Radiological Case Report

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Abstract

The increasing global demand for cosmetic body contouring has led to a rise in complications associated with illicit or unregulated dermal filler injections, particularly in the gluteal region. These complications may present months or years after injection and pose diagnostic challenges due to nonspecific clinical symptoms. Magnetic resonance imaging (MRI) plays a crucial role in characterizing the extent, distribution, and tissue involvement of injected foreign materials and their inflammatory sequelae. We present a case of a young female patient with chronic bilateral gluteal symptoms following dermal filler injection, highlighting the characteristic MRI findings of a foreign-body granulomatous reaction and correlating these with clinical and surgical observations. This case emphasizes the diagnostic value of MRI in differentiating filler-related complications from other soft-tissue pathologies and in guiding appropriate management.

Introduction

The use of injectable dermal fillers for body contouring and cosmetic augmentation has increased significantly over the past two decades, particularly for gluteal enhancement. While approved, biodegradable fillers are generally considered safe when used appropriately, the illicit use of non-approved or permanent substances such as free silicone and other non-absorbable materials continues to pose serious medical risks. These substances can elicit chronic inflammatory responses, leading to delayed complications that may present months or even years after the initial injection, often complicating diagnosis and management(1).

Foreign-body granulomatous reactions represent one of the most challenging long-term complications of injectable fillers. These reactions are driven by the host immune response to persistent foreign material and are characterized histologically by macrophage infiltration, multinucleated giant cells, fibrosis, and chronic inflammation. Clinically, patients may present with pain, induration, contour deformity, or progressive soft-tissue enlargement, frequently without overt signs of infection, making imaging evaluation essential for accurate diagnosis (2).

Magnetic resonance imaging (MRI) plays a pivotal role in the assessment of filler-related complications due to its superior soft-tissue contrast and ability to characterize the distribution, composition, and extent of injected materials (3). Understanding the typical MRI appearances of various fillers and their associated inflammatory reactions is crucial for distinguishing these entities from neoplastic, infectious, or degenerative soft-tissue conditions. This article focuses on the radiological features of chronic foreign-body granulomatous reactions following gluteal filler injections, emphasizing MRI findings and their diagnostic implications(4).

Case Presentation

A 33-year-old female presented with a long-standing history of progressive bilateral gluteal discomfort, firmness, and contour changes. The patient reported having undergone cosmetic gluteal augmentation four years earlier using an injectable dermal filler administered outside a regulated medical setting. The specific composition and volume of the injected material were unknown. Initially asymptomatic, the patient gradually developed persistent pain, increasing firmness of the buttocks, and visible changes in gluteal contour over time.

By the time of presentation, the patient experienced discomfort while sitting and during daily activities, along with dissatisfaction with the cosmetic appearance of the gluteal region. Physical examination revealed bilateral gluteal enlargement with loss of normal contour and areas of diffuse induration. No signs of acute infection, such as erythema or fluctuance, were present. Preoperative clinical photographs demonstrated bilateral gluteal asymmetry, surface irregularity, and ptosis, most evident on posterior and oblique views (Figures 1 and 2).

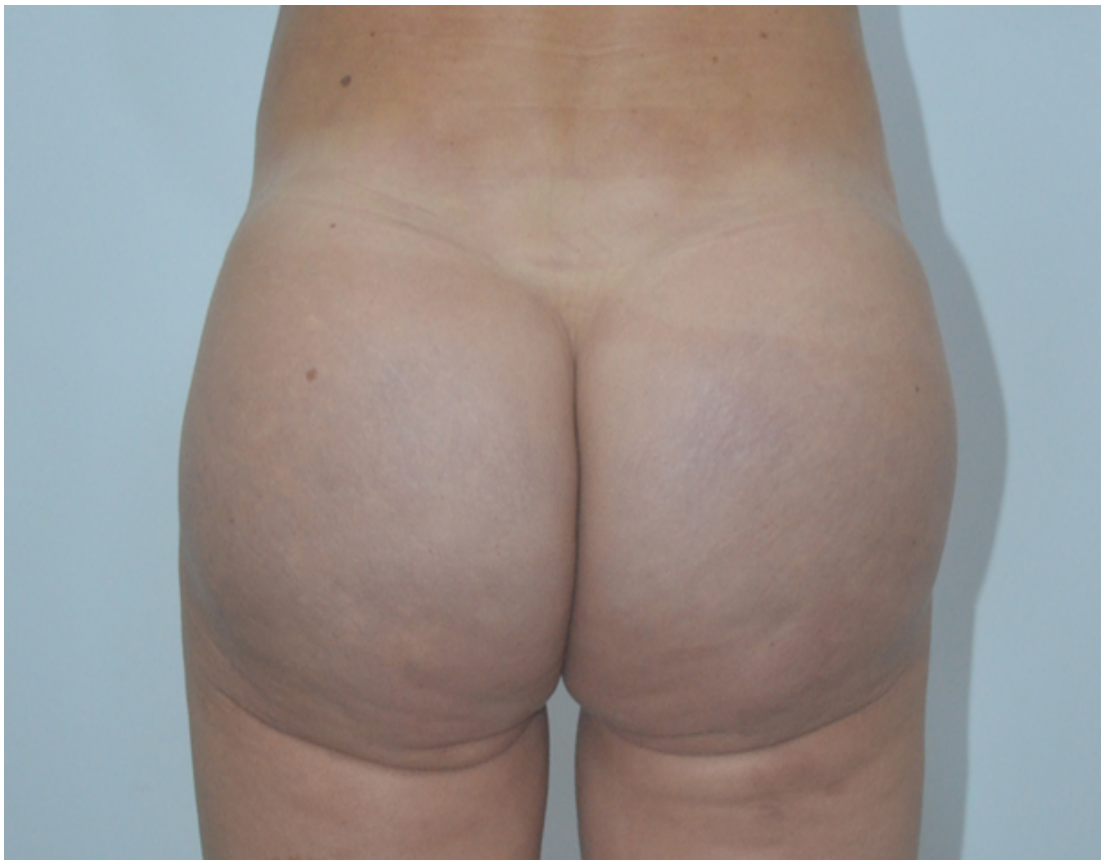

Figure 1 - Clinical posterior view of the patient before surgical intervention, demonstrating bilateral gluteal enlargement with loss of normal contour and surface irregularity. The findings reflect diffuse subcutaneous

involvement consistent with prior dermal filler injection and chronic tissue reaction.

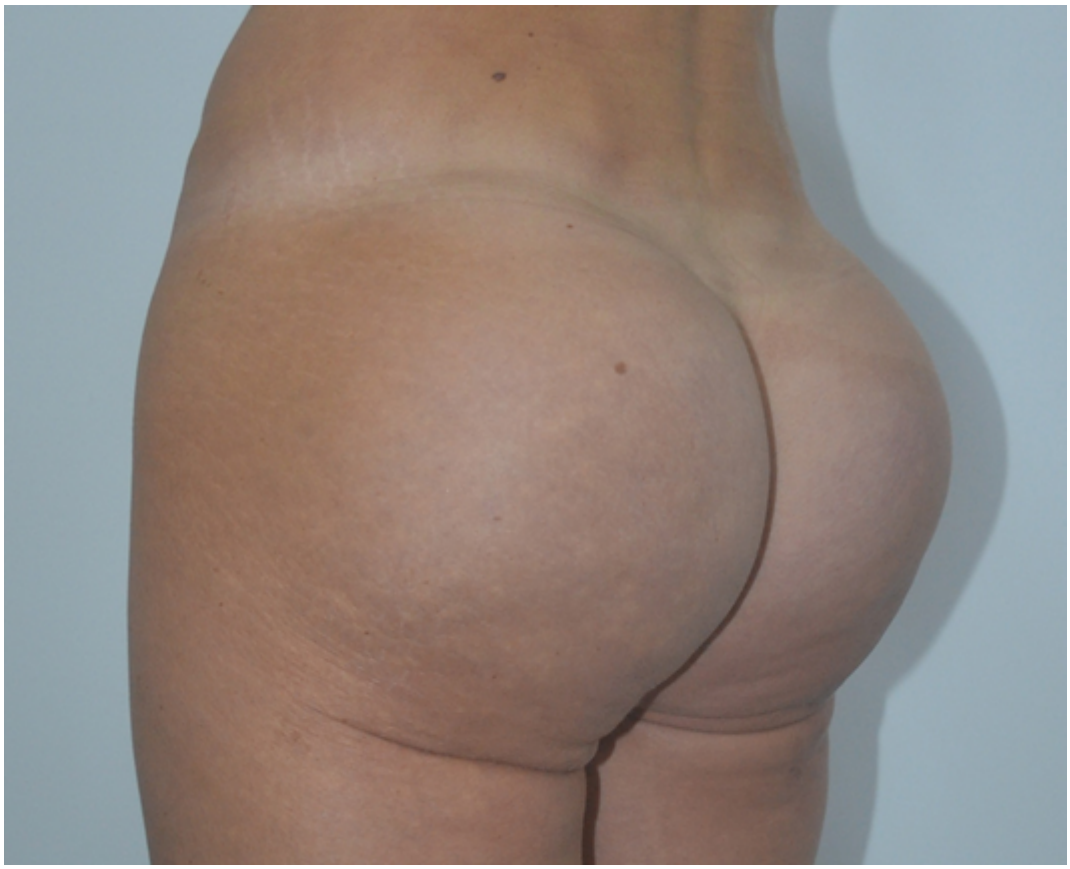

Figure 2 - Clinical oblique view of the left gluteal region, showing exaggerated posterior projection, altered gluteal curvature, and contour deformity. These external changes correlate with the extensive subcutaneous abnormalities later identified on MRI

Given the chronicity of symptoms and suspicion of filler-related complications, an MRI of the pelvis and gluteal regions was requested for further evaluation.

MRI Protocol

The patient was examined using a Siemens Skyra 3 Tesla MRI in the axial, coronal, and sagittal planes without intravenous contrast injection. The imaging protocol included T1-weighted images (T1WI), T2-weighted images (T2WI), and Short tau inversion recovery (STIR) images. These sequences were selected to optimize visualization of subcutaneous tissues, identify inflammatory changes, and assess potential involvement of the gluteal musculature and deeper pelvic structures.

Radiological Findings

MRI images of the buttocks demonstrated bilateral gluteal enlargement with loss of normal contour and surface irregularity. Bilateral diffuse, almost symmetrical, rounded, and elongated abnormal signal areas are noted in the subcutaneous fat of the gluteal region, extending to the superficial portions of the gluteus maximus; consistent with prior dermal filler injection.

On axial T1-weighted images, multiple fairly defined nodular and elongated areas of altered signal intensity were identified throughout the subcutaneous fat, appearing predominantly hypointense relative to surrounding adipose tissue (Figure 3). These lesions were distributed symmetrically bilaterally, extending across large portions of the gluteal region and the superficial parts of the gluteus maximus muscle.

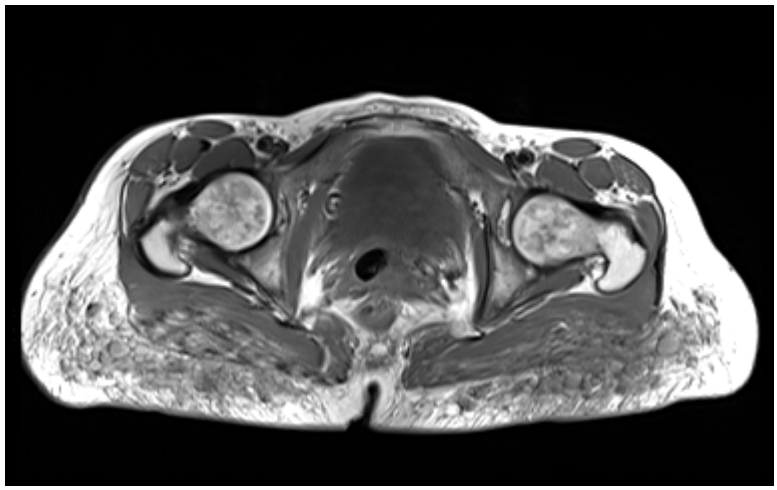

Figure 3 – Axial T1WI (bilateral gluteal subcutaneous fat and muscle involvement).

On T2-weighted and STIR sequences, the same areas demonstrated heterogeneous hyperintensity and no suppression of signal on the fat-suppressed sequence, with a clustered (7), cystic-appearing morphology. The lesions varied in size and shape and were surrounded by areas of increased signal intensity consistent with chronic inflammatory and muscle edematous changes. The sagittal images clearly demonstrated that the abnormalities extended through 2.5 cm of the gluteus maximus muscle, with no evidence of fluid collections or muscle fibrous disruption (Figure 4).

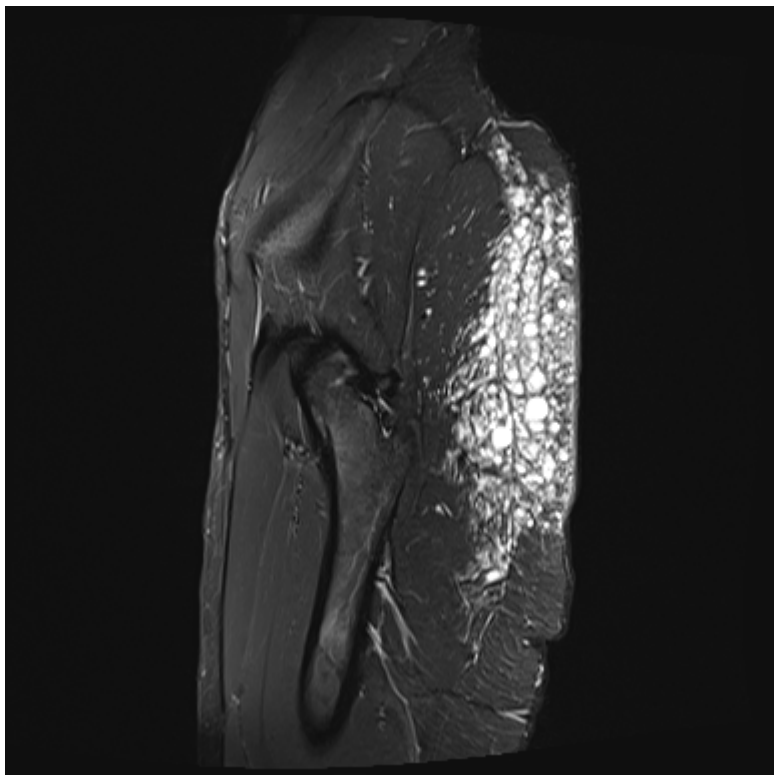

Figure 4 – Sagittal STIR image, illustrating the predominant subcutaneous location of the lesions with underlying muscle edema.

Coronal T2 and STIR images further highlighted the bilateral, symmetrical nature of the findings, with diffuse involvement of the superficial soft tissues and no focal abscesses or fluid collections suggestive of acute infection. No significant pelvic lymphadenopathy or osseous abnormalities were observed. These imaging features were highly suggestive of a chronic foreign-body granulomatous reaction related to freely injected dermal filler material (Figure 5).

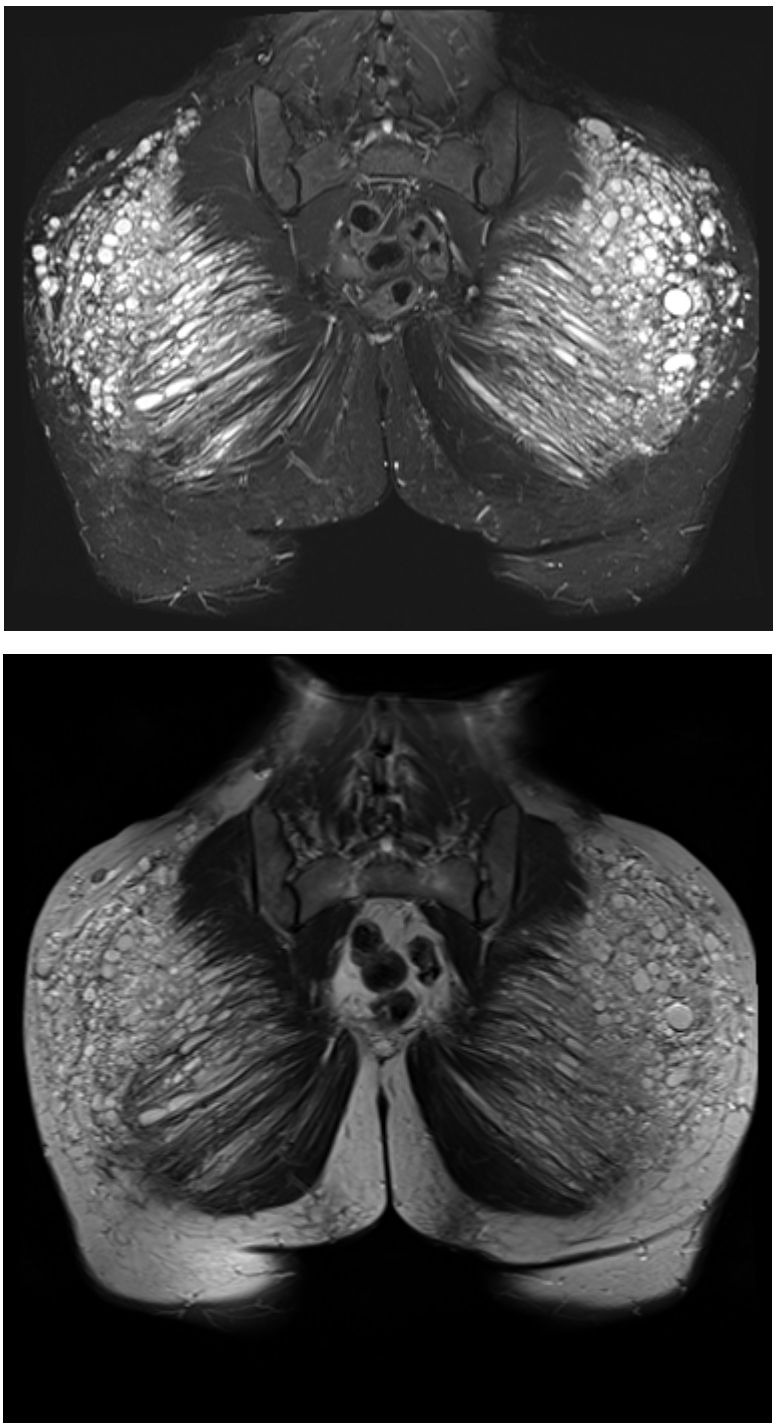

Figure 5 - Coronal STIR and T2-weighted images of the pelvis, highlighting the bilateral and symmetrical involvement of the gluteal subcutaneous tissues and superficial gluteus maximus muscle without evidence of abscess formation, pelvic organ involvement, or osseous abnormalities.

Radiologic–Clinical and Surgical Correlation

Based on the MRI findings and persistent clinical symptoms, surgical intervention was planned. The incisions were made in the upper part of the buttocks, along the bikini line, to help conceal the resulting scars. The pattern involved two symmetrical, curved incisions that radiated outward, beginning near the intergluteal crease and extending toward the hips (9).

Intraoperative exploration confirmed extensive subcutaneous involvement with multiple cystic and nodular lesions containing gel-like foreign material. The distribution and extent of these lesions closely correlated with the areas of abnormal signal intensity identified on MRI. Intraoperative images demonstrated bilateral incisions and exposure of affected subcutaneous tissues, revealing distorted tissue planes and chronic inflammatory changes (Figures 6 and 7).

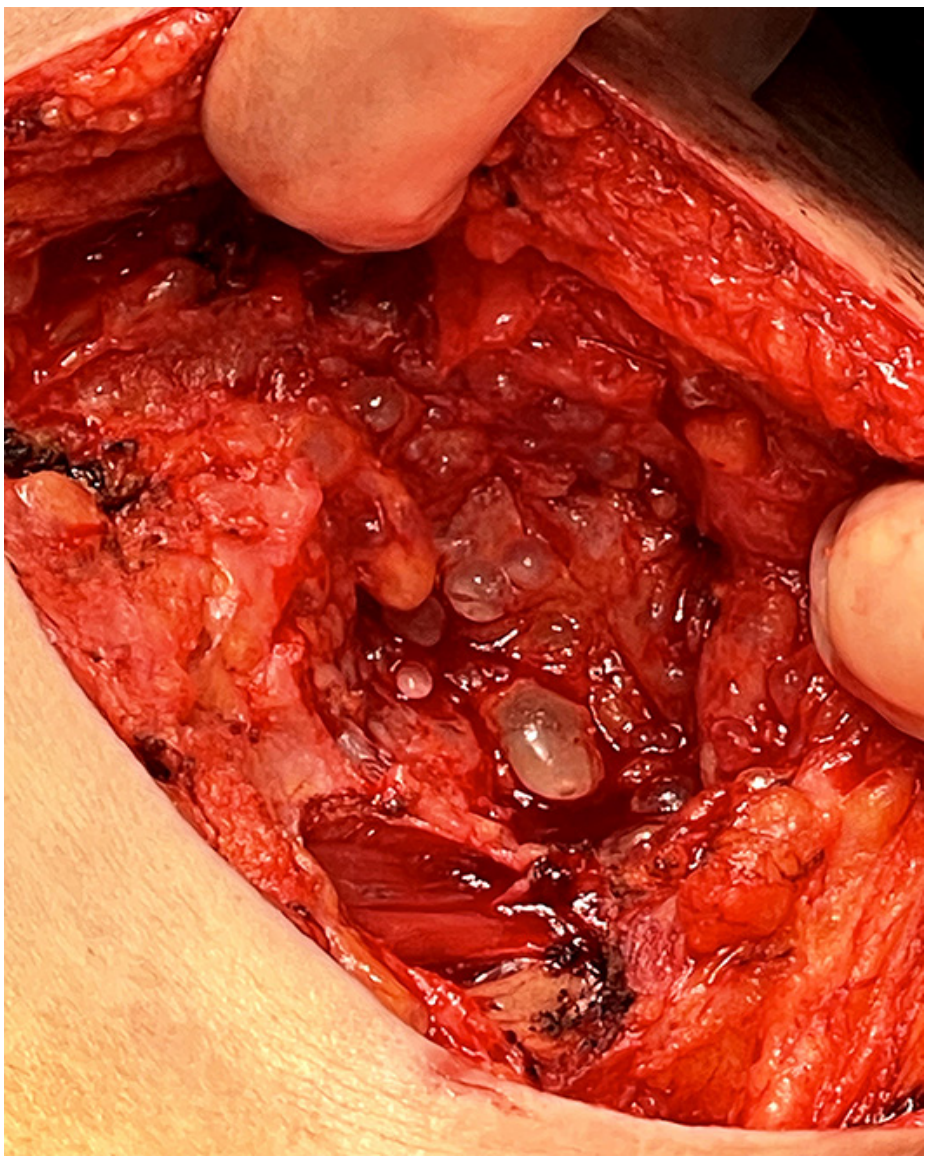

Figure 6 - Intraoperative photograph showing visible distorted subcutaneous tissue planes and multiple cystic foreign-body lesions corresponding to the MRI-identified abnormal areas.

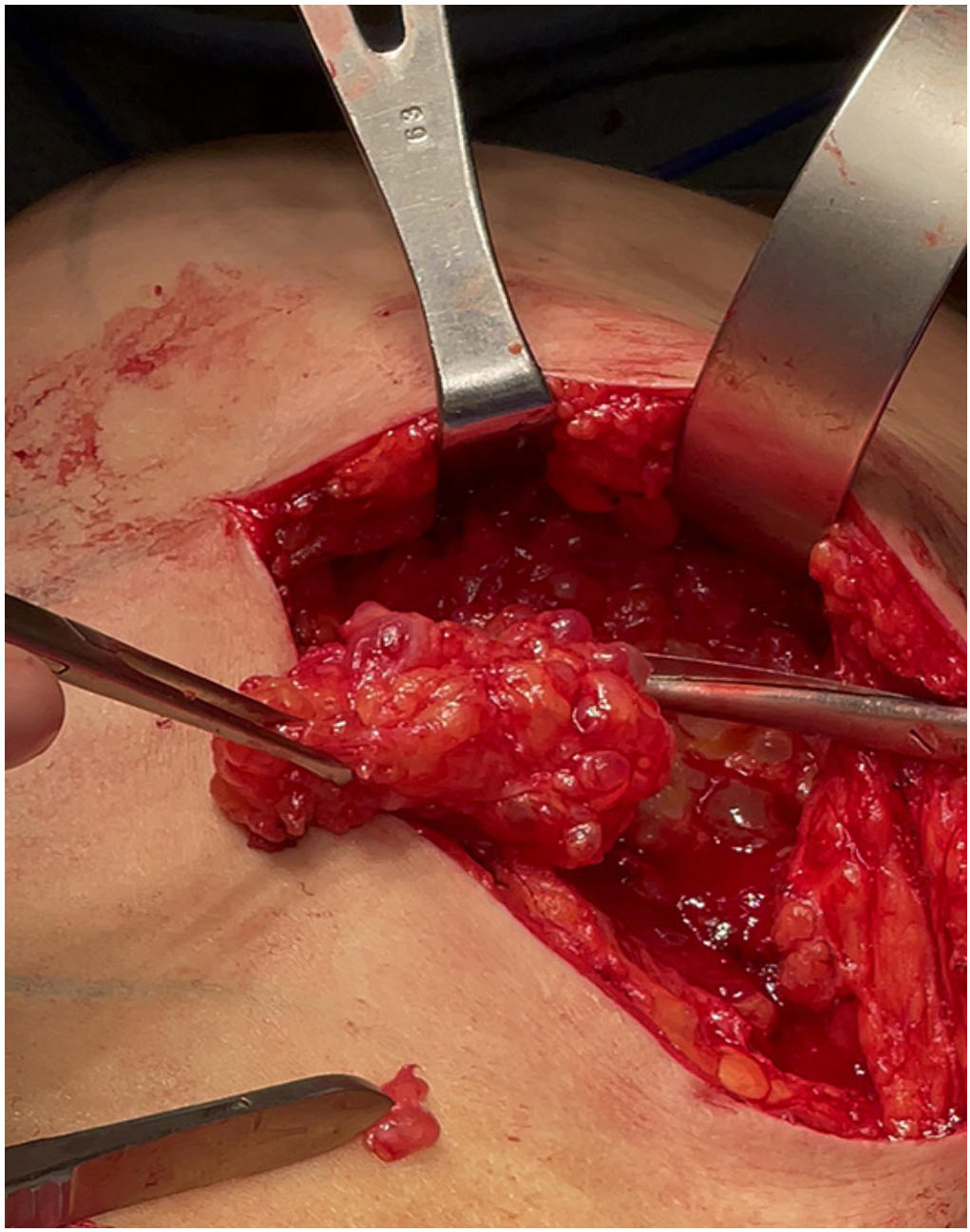

Figure 7 - Intraoperative view, demonstrating the removal of diseased subcutaneous tissue containing hundreds of cysts, confirming the extensive superficial distribution of the pathology.

Gross examination of the excised specimens showed multiple clustered nodular masses with a translucent, gelatinous appearance, consistent with retained filler material surrounded by inflamed adipose tissue (Figure 8 and video 1). These findings supported the MRI-based diagnosis of a chronic foreign-body granulomatous reaction.

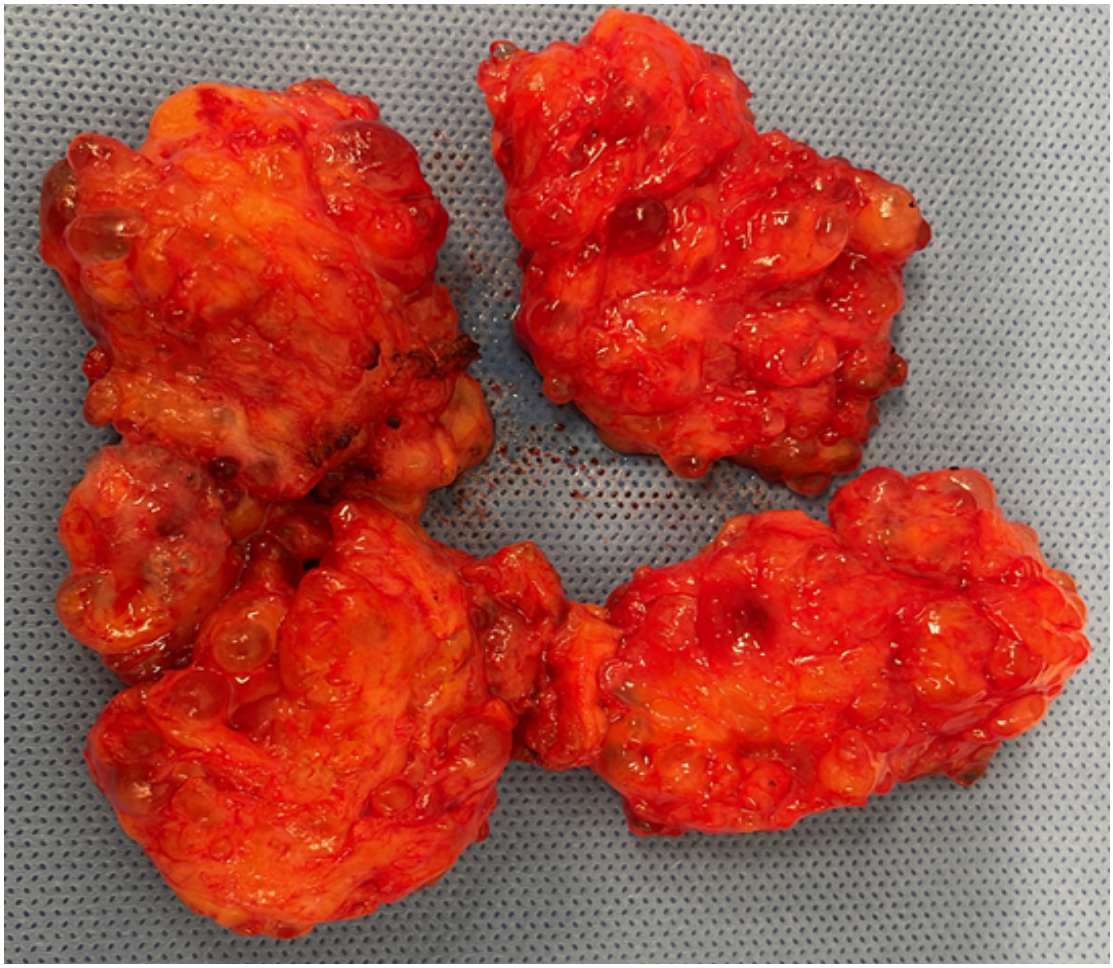

Figure 8 - Gross photograph of excised specimens, revealing multiple clustered nodular masses containing translucent, gelatinous foreign material surrounded by inflamed adipose tissue, consistent with retained dermal filler and foreign-body granulomatous reaction.

Supplementary Video: https://youtube.com/shorts/A6E5u4Zbfv0?si=QQG0CTyh0B4O_Wpv

Video 1 - Intraoperative video footage demonstrating the surgical excision of a cyst previously removed, containing gel-like foreign material.

Discussion

Complications arising from illicit or permanent dermal fillers have become an increasingly recognized concern in aesthetic and reconstructive medicine. Unlike biodegradable fillers, non-absorbable substances such as free silicone persist indefinitely within tissues, provoking a chronic inflammatory response that may remain clinically silent for years before manifesting as pain, swelling, deformity, or functional impairment. This delayed presentation often leads to diagnostic confusion and inappropriate initial management (5).

Histopathologically, these reactions are characterized by foreign-body granuloma formation, fibrosis, and

chronic inflammation. Radiologically, these pathological changes manifest as complex soft-tissue abnormalities, with MRI serving as the most informative imaging modality. As described by Abdelmohsen (7), the MRI appearance of injectable fillers varies according to their composition but commonly includes low to intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted or STIR sequences, reflecting the hydrophilic or gelatinous nature of the injected material and associated inflammatory changes.

The symmetrical and diffuse subcutaneous distribution observed in this case is a hallmark feature of filler injection complications and helps differentiate them from other conditions. Fat necrosis, for example, typically demonstrates central fat signal intensity with surrounding fibrotic changes, while chronic abscesses usually present with rim enhancement and are accompanied by systemic or localized signs of infection. Soft-tissue tumors, in contrast, tend to appear as focal, mass-like lesions with variable enhancement patterns rather than widespread symmetrical involvement (10).

Early recognition of these characteristic MRI findings is critical, as delayed diagnosis may result in progressive fibrosis, increased surgical complexity, and poorer functional and cosmetic outcomes. Radiologists play a central role in identifying filler-related complications, guiding clinicians toward appropriate management strategies, and preventing misdiagnosis as malignancy or infection. Increased awareness of the imaging features associated with chronic foreign-body reactions is therefore essential in regions where cosmetic filler use is prevalent and often unregulated.

Conclusion

This case highlights the critical role of MRI in diagnosing chronic complications of gluteal dermal filler injections. The characteristic imaging findings of diffuse, bilateral subcutaneous nodular and cystic lesions with associated inflammatory changes are highly suggestive of a foreign-body granulomatous reaction. Accurate radiologic assessment enables appropriate clinical decision-making and surgical planning, underscoring the importance of awareness of filler-related complications among radiologists and clinicians involved in aesthetic and reconstructive care.

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